

XV. Report on the Odonata collected by the British Ornithologists' Union Expedition and the Wollaston Expedition in Dutch New Guinea. By HERBERT CAMPION\*.

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IT is gratifying to find that the collection of Dragonflies made by Mr. A. F. R. Wollaston, small as it is, should contain two new species, both of them of unusual interest. These, together with the remaining specimens, form a valuable addition to the collections of the British Museum (Natural History), which are not at all rich in Odonata from New Guinea.

One of the Dragonflies, *Teinobasis metallica* Först., was obtained at Base Camp, sea-level, Setakwa River, Nov.-Dec. 1912, and a new *Synthemis* was met with on the Utakwa River, 4000 to 6000 ft., Jan.-Feb. 1913. All the others were obtained on the Utakwa River, 2500-3000 ft., in February, 1913.

Detailed information concerning the known species represented in the present collection will be found in some of Dr. F. Ris's recent writings, notably his magnificent monograph of the Libellulinae, his paper on the Dragonflies of the Lorentz Expedition ('Nova Guinea,' ix., Zoologie, pp. 471-512, 1913), and his paper on Aru- and Kei-Island Odonata (Abhandl. Senckenberg. Naturf. Ges. xxxiv. pp. 503-536, 1913).

The two new species, *Synthemis wollastoni* and *Oda risi*, are the only additions made herein to the known Odonata of New Guinea. Another apparently endemic form is the typical *Teinobasis metallica*, but the five remaining species obtained by Mr. Wollaston have a more extended distribution.

Subfamily Agrioninae.

TEINOBASIS METALLICA Först.

1 ♂. Base Camp, sea-level, Setakwa River, Nov.-Dec. 1912.

Dr. Ris informs me that this specimen, which he has seen, is certainly identical with the insect so named by him in the two faunistic papers cited above, and probably identical also with that referred to in Förster's original description.

\* Communicated by W. R. OGILVIE-GRANT, F.Z.S.



Subfamily *Æschininae*.

PLATYCANTHA DIRUPTA Karsch.

1 ♀. Utakwa River, 2500–3000 ft., Feb. 1913.

Subfamily *Corduliinae*.Genus *SYNTHEMIS* Selys.

*Synthemis* Selys, C. R. Soc. Ent. Belg. xiv. p. vi (1870); id. Bull. Acad. Belg. (2) xxxi. p. 557 (1871); Tillyard, Proc. Linn. Soc. N.S.W. xxxv. pp. 335–337 (1910).

*Palaeosynthemis* Förster, Ann. Mus. Nat. Hungarici, i. p. 546 (1903); id. Wien. entomol. Zeitg. xxvii. p. 25 (1908).

Of the three genera composing the group *Synthemina*, *Eusynthemis* and *Choris-themis* are confined to the continent of Australia, as are also most of the species falling into the restricted genus *Synthemis*. The new species described below possesses an ovipositor and a membranne, both of which are in well-developed condition, and clearly belongs to *Synthemis* proper. Leaving out of account an undescribed insect from New Guinea preserved in the Genoa Museum, and labelled by de Selys *Synthemis beccarii*, the sole species from that island characterised, so far, is *S. prinigenia* Först., which is known to me by description alone. It would appear that the female of Förster's species agrees very well in several respects with the beautiful insect now before us, such as similarity in size, the single cross-vein in the median space, and the presence of a cross-vein in the triangle of the hind-wing. The following table, however, will sufficiently distinguish the females of the two New Guinea species:—

Lower blades of ovipositor, in lateral view, longer and narrower; fore-wing and tip of hind-wing hyaline; vertex and summit of frons metallic blue.	<i>prinigenia</i> Först.
Lower blades of ovipositor, in lateral view, shorter and broader; tips and certain other areas of all wings coloured; vertex and summit of frons blackish.	<i>wollastoni</i> , sp. n.

*Synthemis miranda* Selys, another large species, is still known only from the unique female obtained from New Caledonia. It may be readily separated from *S. wollastoni* by the entirely different pattern of the wing-coloration, by its possessing four or five cross-veins in the median space, and by the anal loop being divided into three portions, as in *S. regina* Selys, ♀.

Like *S. prinigenia* and *S. miranda*, *S. wollastoni* may be discriminated by its superior size from all the members of the genus so far described from Australia, the hind-wing in all three species exceeding 40 mm. in length.

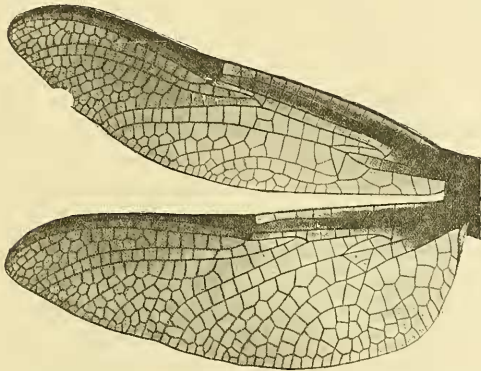
*SYNTHEMIS WOLLASTONI*, sp. n. (Text-figs. 38 & 39.)

1 ♀. Utakwa River, 4000–6000 ft., Jan.–Feb. 1913. (*Type of the species.*)

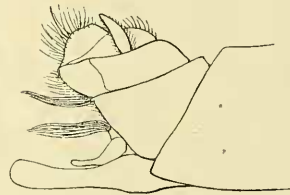
♀ (holotype).—Length of abdomen, including ovipositor, 48.5 mm. Length of hind wing 42 mm.

Labium and clypeus dark reddish-brown, labrum bright reddish-brown. Frons dark reddish-brown anteriorly, brownish above, hairy, excavated at the summit, coarsely punctate. Vertex hairy, brownish-black, finely punctate. Basal joints of the antennæ black; the bristle missing. Prothorax black, edged with yellow posteriorly. Dorsum of thorax proper without humeral or antehumeral stripes or spots; dark brown anteriorly, with metallic-green reflections; between the wings very dark reddish-brown, with a central yellow spot; mid-dorsal carina yellow; sides dark reddish-brown, with purple reflections traversed obliquely by an uninterrupted bright yellow stripe, 1 mm. broad at its widest part, enclosing the metastigma; inferior surface yellowish to brownish.

Text-figure 38.



Text-figure 39.



Text-fig. 38.—Left wings of *Synthemis wollastoni*, sp. n. Type ♀. Enlarged. F. W. Campion photo.

Text-fig. 39.—Lateral view of terminal segments of *Synthemis wollastoni*, sp. n. Type ♀. Greatly enlarged. H. Knight del.

Wings\* for the most part richly suffused with amber, the colour being most intense in the costal, subcostal, median, and cubital spaces, and also along the costal margin beyond the nodus; a more or less hyaline space in the fore-wing, in which is situated

\* Mr. R. J. Tillyard kindly informs me that the wing-venation of *S. wollastoni*, as shown in a photograph which I sent him, agrees exactly with that of his unique female of *S. claviculata* Tillyard, from N. Queensland. The New Guinea species is abundantly distinct, however, by reason of its considerably larger size and by the greatly superior development of its ovipositor. He also draws my attention to the extreme variability of the extent and arrangement of suffused areas in the wings of *Synthemis* females, even in different examples of the same species, and, in the case of bred specimens, in the same individual, according to age.

the subtriangle, the triangle, and all that portion of the wing, at least, which lies below  $M_{1+3}$ ; another almost hyaline space in the hind-wing includes all the cells below A, embracing the anal loop, as well as the triangle, subtriangle, and a few of the cells immediately beyond them. Reticulation, including C, black. No creamy spots at the wing-bases. Pterostigma 3 mm. long, dark reddish-brown, unbraced. Membranule 4.5 mm. long, whitish. Venation generally more open than in the female of *S. eustalacta* Burm., the type of the genus. Antenodals of the first series 12 in the fore-wings, and 8 in the hind-wings. Postnodals 7-8 in the fore-wings, 9 in the hind-wings. Arculus in the fore-wing very oblique, in the hind-wing more vertical; in all the wings straight, or nearly straight, arising at or very near the level of the second antenodal of the first series. Only one cross-vein in the supertriangle in all the wings. Median space with a single cross-vein only in all the wings. Four cubito-anal cross-veins in each of the left wings, and five in each of the right wings. Triangles and subtriangles of the fore-wings free. Triangles of the hind-wings with one curved cross-vein in each; the convex side of the cross-vein directed anteriorly. Discoidal area in the fore-wings commencing with a double cell, followed by three single cells, then by a few double cells, succeeded by several rows of cells. Discoidal area in the hind-wings with at first a few single or double cells, rapidly giving place to several rows of cells. Four bridge-veins in all the wings. Hind-wing triangle not retracted; the distance from the arculus to the inner angle of the triangle, measured along the cubitus, is somewhat more than half the length of the triangle. Anal loop in the hind-wing consisting of a single enclosure, and containing 8 cells in the right wing and 7 cells in the left.

Legs: coxæ light reddish-brown; femora light reddish-brown, black at the apex; tarsi and claws black. Abdomen very dark reddish-brown, almost black, with a pair of conspicuous yellow spots on each of the segments 2, 3, and 4, lying on each side of the mid-dorsal carina, near the middle of the segment; similar but smaller spots probably present on 5, 6, and 7; body apparently constricted at 4, but, as it is crushed laterally, its shape cannot be stated with certainty; 8 and 9 progressively smaller, and cut off obliquely at the apex; 10 very small, and, like 9, directed conspicuously upwards; a tuft of very long hairs springs from the ventral surface of 9, and a similar tuft from 10; apex of abdomen hairy. Anal appendages black, subconical, pointed, barely projecting beyond the apex of the abdomen. Ovipositor: lower pair of blades dark reddish-brown, nearly straight, concave within, parallel, spatulate and incurved at the tips, projecting considerably beyond the apex of the abdomen; upper pair of blades black, stout and curved in the basal half, then parallel with the lower pair, divergent, concave within, not reaching to the level of the end of the abdomen.

MACROMIA TERPSICHORE Först.

1 ♂. Utakwa River, Feb. 1913.

## Subfamily Libellulinae.

## TETRATHEMIS IRREGULARIS LEPTOPTERA Selys.

1 ♂. Utakwa River, Feb. 1913.

## Genus ODA Ris.

(Collections Selys, Libell., fasc. ix, pp. 18 &amp; 61, 1909.)

This genus was established for the reception of the single species *Nannophlebia* (?) *dohrni* Krüger from Sumatra. Other specimens have been obtained in Borneo, and there is a record, which needs confirmation, of a female from the Marianne Islands. To the same genus may now be added a second species, which resembles the type-species very closely in general appearance. For purposes of comparison, I have had before me a male and female of *Oda dohrni*, in fine condition, kindly lent to me by Mr. F. F. Laidlaw (Matang Road, Sarawak, Borneo, 9. xi. 09, *J. C. Moulton*). I have also referred to Dr. F. Ris's photographs reproduced in the above-named work as figures 25 (left wings of ♂), 26 (left wings of ♀), 27 (segment 2 of ♂), and 28 (anal appendages of ♂).

The new species has been referred to *Oda* upon the advice of Dr. Ris, notwithstanding its disagreement with *O. dohrni* in several important characters. Its inclusion therein will necessitate some modification in the definition of that genus as given by its author, and the following description has been made to cover all the characters which must be taken into account whenever the genus is re-defined.

I have great pleasure in dedicating the interesting new species to Dr. F. Ris, to whom I am indebted for much valuable assistance in studying its characters and affinities, as well as for kind help with other difficult species contained in the present collection.

Leaving venational characters out of account for the moment, the males of the two known species of the genus may be separated thus:—

Abdominal segments 1, 2, and 3 very large, followed by a sudden constriction ; labrum black ; tibiae of hind-legs black ; a broad black band lying on the second lateral suture of the thorax . . . . .	<i>dohrni</i> Krüger.
Abdominal segments 1, 2, and 3 not inflated or followed by any constriction ; labrum bright yellow ; tibiae of hind-legs yellow ; no black band on the second lateral suture of the thorax . . . . .	<i>risi</i> , sp. n.

ODA RISI, sp. n. (Text-fig. 40.)

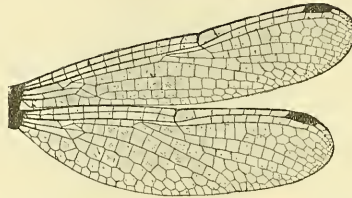
1 ♂. Utakwa River, Feb. 1913. (*Type of the species.*)

♂, holotype (not fully matured, head flattened by pressure, and abdomen somewhat crushed). Length of abdomen, including anal appendages, 19.5 mm.; length of hind wing 22 mm.

Labium, labrum, face, and anterior aspect of the frons bright yellow; dorsal aspect of the frons and vertex metallic bluish-green. Vertex broad, rounded in front, undivided. Occipital triangle black. Lobe of the prothorax smaller than in *O. dohrni*, its posterior margin curving convexly, notched slightly in the middle. Ground-colour of the thorax yellow; a broad black band on each side of the dorsum, enclosing a large yellow oval spot lying on the mid-dorsal carina; a narrower black band traversing the mesothoracic epimeron longitudinally.

Wings entirely hyaline. Hind-wing conspicuously broader than the fore-wing—only slightly broader in *O. dohrni*. Pterostigma dark brown, 2 mm. long. The venation resembles that of *O. dohrni* in the following characters:—The arculus distal to the second antenodal in all the wings; the branches of M arising near the bottom of the arculus, and fused together for a considerable distance; the four triangles and the two subtriangles are free; no cross-veins in the supertriangles; one cross-vein only between the bridge and  $M_{1+2}$ ;  $M_2$  slightly arched; only one row of cells between  $\text{Rs}$ . and  $\text{Rspl}$ .; the discoidal area of the fore-wing narrow and consisting of an

Text-figure 40.

Right wings of *Oda rasi*, sp. n. Type ♂. Enlarged. F. W. Campion photo.

undivided row of cells; the bounding longitudinal veins almost parallel to near the margin of the wing; the anal loop in the hind-wing rudimentary and difficult to recognise;  $\text{Cu}_1$  in the hind-wing well separated from the lower corner of the triangle. The venation differs from that of *O. dohrni* in the under-mentioned respects:—The fore-wing triangle is less regular in form, as the proximal portion of the costal side (cross-vein) is considerably shorter than the distal portion ( $M_4$ ); the base of the triangle in the hind-wing is placed distinctly beyond the level of the arculus, instead of coinciding with it more or less exactly; the cross-vein forming the costal side of the same triangle does not meet, at its distal end, the cross-vein bounding the triangle externally, thus making the enclosure 4-sided (in *O. dohrni* the two cross-veins are joined distally, and the enclosure is 3-sided); 12 complete antenodals in the fore-wing and 9 in the hind-wing, as compared with 9 in the fore-wing and 7 or 8 in the hind-wing; 6 postnodals in all the wings (in the six fore-wings of *O. dohrni* examined, four have 6 postnodals

and two have 7); in the six hind-wings, four have 6 postnodals and two have 7; one regular cubito-anal cross-vein only in each wing, placed at or proximal to the level of the first antenodal (in *O. dohrni* there is usually another, placed beyond it, in the hind-wing); the second cubito-anal cross-vein in the fore-wing, forming the basal side of the subtriangle, is placed more obliquely, thus appearing less like a continuation of vein A; Rspl. well defined in all the wings (barely recognisable in *O. dohrni*).

Legs long and slender; the coxæ and trochanters of all the legs yellow; femora brownish-black externally, yellowish-brown internally; tibiæ for the most part yellow; tarsi blackish. Femur of hind-legs with an external row of about 20 very short spines and a few long hairs projecting beyond them, terminating at the distal end in a long spine; an internal row of about 12 long straight hairs; femur of mid-legs with an external row of about 8-10 long slender spines, increasing in length progressively from the base of the femur to the apex; an internal row of about 20 long slender hairs; tibial spines numerous, long, and slender; tarsal claw-teeth small, at about two-thirds the length of the claw. Abdomen not constricted after the third segment, as it is in *O. dohrni*. Genitalia of segment 2 crushed and not well-displayed; anterior lamina clothed with long hairs, about as broad as long, parallel-sided, and with the apical margin rounded; the hamules twisted out of their natural position; viewed laterally the anterior branch appears as a long, stout, slightly-curved lobe, ending in a rather sharp point and touching the genital lobe; posterior branch, concealed in lateral view, short, curving towards the anterior branch, and apparently very slender; genital lobe erect, and rather long and narrow. Segment 1 yellow, with the basal half of the dorsum black; 2 black with a little yellow at the sides, basally; 3 and 4 black, without visible markings; 5 and 6 black, with a large yellow spot on each side; 7 yellow, with a black ring at the base and another at the apex; 8, 9, and 10 black. Upper anal appendages black, about as long as segments 9 and 10 taken together, curving downwards and becoming stouter for the greater portion of their length, and then giving rise suddenly to a sharp spine directed backwards; lower appendage yellowish, shorter than the upper appendages, concave above, broad basally, heart-shaped.

LYRIOTHEMIS MEYERI Selys.

2 ♂, 2 ♀. Utakwa River, Feb. 1913.

NEUROTHEMIS DECORA Brauer.

1 ♂, 3 ♀. Utakwa River, Feb. 1913.

♂. Wings purple-blue, without apical spots. I have compared the male example with a somewhat larger male from New Guinea in the British Museum (Stephansort, Astrolabe Bay, *Biro*). In the Stephansort specimen the large basal coloured area approaches nearer to the pterostigma in all the wings by about 2 cells, but the milky

band beyond it is not so wide as in the Uta<sup>k</sup>wa River specimen, and does not reach to the distal end of the pterostigma in any of the wings.

The three females differ from one another but little in size, the hind-wings of two specimens measuring 28 mm. in length and of the third specimen 29 mm. The large basal coloured area, purple-black in one specimen and rich brown in the others, is variable in the amount of its extension outwards; in its maximum development it approaches the pterostigma to within 4 cells in the fore-wing and 3 cells in the hind-wing; in its minimum development as many as 7 cells lie between its margin and the pterostigma in the fore-wing and 5 in the hind-wing. The milky band is unequal in size in the different specimens compared. The apical brown cloud is also somewhat variable in extent, in some cases reaching backwards as far as the proximal end of the pterostigma, while in other cases it ceases before the middle of the pterostigma.